IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANTS	:	KATSUBE, *et al.*
SERIAL NO.	:	09/066,168
FILED	:	April 24, 1998
FOR	:	PERMSELECTIVE MEMBRANE MODULE
GROUP ART UNIT	:	1723
EXAMINER	:	A. Fortuna

ASSISTANT COMMISSIONER FOR PATENTS
Washington D.C. 20231

SECOND APPEAL BRIEF

SIR:

This is an Appeal from an Office Action dated August 27, 2002, finally rejecting each of the pending claims, claims 1-2 and 5-6. The Notice of Appeal was filed on November 22, 2002, thus the period to file this Appeal Brief expires on January 22, 2003.

This is the second appeal filed in this case, following the September 11, 2001 re-opening of the case for further prosecution following the filing of Appellants' first Appeal Brief. The Appellants believe no fees are due for the filing of this second brief, consistent with the direction provided in The Manual of Patent Examining Procedure, § 1208.02, which notes, in pertinent part, that "if prosecution was reopened prior to a decision on the merits ... the fee paid for the notice of appeal, appeal brief, and request for oral hearing (if applicable) will be applied to a later appeal on the same application." Notwithstanding the Appellants' belief that no fee is due for the filing of this Notice, the Commissioner is hereby authorized to charge payment of any additional fees required or credit any overpayment to Deposit Account No. 11-0600.

1. REAL PARTY IN INTEREST

The real party in interest in this matter is Toyo Boseki Kabushiki Kaisha. Toyo Boseki Kabushiki Kaisha owns this application by virtue of an assignment recorded with the Office at reel 9162, frame 0956.

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

3. STATUS OF THE CLAIMS

Claims 1-2 and 5-6 are pending in this application. The claims are presented in their current form in the attached Appendix.

Claims 1-2 and 5-6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,293,419 to Sekino, *et al.* ("Sekino") in view of U.S. Patent No. 5,380,433 to Etienne, *et al.* ("Etienne"), U.S. Patent No. 5,160,042 to Bikson, *et al.* ("Bikson") and an article, *Synthetic Membranes and Membrane Separation Processes* by Matsuura ("Matsuura").

This appeal is an appeal from the rejection of all the claims.

4. STATUS OF AMENDMENTS

No amendments have been filed since the August 27, 2002 Final Office Action. All amendments to date have been entered.

5. SUMMARY OF THE INVENTION

The present invention provides a low-cost permselective module for fluid treatment, such as water desalination. In a first embodiment, the module is a tubular housing containing two co-axial bundles of hollow fibers. Specification at 5-6 and Fig. 1. In this embodiment, a feed fluid to be purified enters the module through an end wall of the module via inlet 3 and passes into a perforated feed tube 5, 5' at the longitudinal centers of the fiber bundles 4, 4'. As the feed fluid moves radially outward through the fiber bundles, purified permeate fluid passes through the walls of the hollow fibers and enters the hollow centers of each fiber. The permeate then moves toward the module end wall facing the end of each bundle, and is discharged from the open ends of the fibers through permeate outlets 11, 11' at each end of the module. In the meantime, the non-permeate fluid (*i.e.*, the fluid that passes radially outward through the fiber bundles without entering the hollow fibers), flows out of the bundles into the annular space between the bundles and the module wall, and thence toward an outlet 13. Outlet 13 is located directly adjacent to an end of the module. Specification at 5-6 and Fig. 1.

The present invention's novel arrangement of fiber bundles, feed inlet and permeate and non-permeate outlets provide a low cost permselective module that, compared to prior art modules, reduces pressure losses, improves separation performance and extends module life. In particular, the Appellants discovered that the combination of feed flow from an end of the module into the centers of the fiber bundles and the location of non-permeate outlet through the side wall of the module very close to the module end results in both lowered pressure drop across the module and minimized build-up of flow-impairing sediments in the vicinity of the outlet.

In another embodiment of the present invention shown in Fig. 2, the permselective membrane module has an inner support plate 22 between the two permselective membrane elements, with the feed tube being closed at one end of the first fiber bundle, and the feed inlet to the second bundle in the support plate. Thus, in this embodiment the module is divided into two sections, with the non-permeate passing out of the first fiber bundle becoming the feed for the second bundle. In all other importance aspects of the invention, however, the module arrangements are unchanged, *i.e.*, the feed still enters both fiber bundles through their center feed distribution tubes, permeate fluid is still removed from the module via both endplates, and the non-permeate outlet remains substantially proximal to the end of the container, with any space downstream of the discharge outlet sufficiently small to allow purging of suspended materials. Specification at 7 and Fig. 2.

6. ISSUE

Whether claims 1-2 and 5-6 patentably distinguish over Sekino in view of Etienne, Bikson and Matsuura under 35 U.S.C. §103(a).

7. GROUPING OF CLAIMS

The claims may be grouped as follows.

A. Claims 1 is directed to a permselective membrane module including two permselective membrane elements.

B. Claim 2 is directed to a permselective membrane module including two permselective membrane elements and an inner liquid receiving plate located between the two elements.

C. Claim 5 is directed to a permselective membrane module corresponding to the module of claim 1, wherein the permeate-liquid outlet is recited as being directly adjacent to the open ends of the permselective membrane elements.

D. Claim 6 is directed to a permselective membrane module corresponding to the module of claim 2, wherein the permeate-liquid outlet is recited as being directly adjacent to the open ends of the permselective membrane elements.

The respective groups of claims stand or fall together for purposes of this appeal.

8. ARGUMENT

The Examiner rejected independent claims 1-2 and 5-6 under 35 U.S.C. § 103(a) as unpatentable over a total of four separate references that allegedly teach or suggest all the features of the present claims, Sekino, Etienne, Bikson and Matsuura.

It is well established that an obviousness rejection must satisfy three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143. Moreover, it is not enough to merely compile a list of elements, as it is also well settled that the mere fact that references can be combined is not sufficient to establish a *prima facie* case of obviousness. *Id.*

Appellants respectfully submit that the Examiner has not met her burden in this case, as she has not established that that the references teach or suggest all the features for which they are cited or that that there is any suggestion to combine the references. Instead, the Examiner has merely compiled a list of components without regard to what the cited references teach, and tied these components together with cursory assertions of obviousness to combine. Moreover, in some cases, the references do not teach the features of the present invention for which they are cited.

Because the Examiner has not established that these four references teach or suggest the present invention to one of ordinary skill in the art seeking to solve the problems addressed by the invention, she has not met here burden under 35 U.S.C. §103(a), and the appealed rejections must be reversed.

A. THE CITED REFERENCES DO NOT TEACH OR SUGGEST THE PRESENT INVENTION.

As noted above, the present invention is directed to a low-cost permselective membrane module with feed and outlet arrangements that provide efficient feed purification while minimizing pressure drop and avoiding build-up of suspended material deposits in the vicinity of the non-permeate fluid outlet. One of the principal features of the present invention is the location of the non-permeate outlet through the container wall "substantially proximal to one end of the container" in order to minimize pressure drop and eliminate significant accumulation of suspended materials in the vicinity of the outlet.. Accordingly, claim 1 recites:

> ... iv) a non-permeated fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall in communication with a gap and the outside of the container wall, and
>
> further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

Claim 1, lines 13-19 (emphasis added). This language reflects Appellants' discovery -- not suggested in the prior art -- that the combination of central feed from the end of a two-bundle module into both fiber bundles, permeate withdrawal directly from the ends of the fiber bundles out the module's end plates, and the placement of the non-permeate outlet through the side of the container *and* sufficiently close to the end of the module, results in direct, minimum-resistance flow fluid paths that minimize pressure drop across the module while also encouraging sediment purging, thereby maximizing efficient feed purification and minimizing long-term pressure drop across the module due to sediment build-up.

The Appellants submit that the present novel permselective membrane module configuration has not been previously taught or suggested.

1. The Examiner Has Impermissibly Attempted to Selectively Combine Elements of Several References, Without Regard to What the References Teach or Suggest.

The Appellants submit that the Examiner has impermissibly attempted to parse the language of claim 1 into such fine parts that she has ignored the claimed invention, and has resorted to selective citation of features from a variety of references without regard as to whether the references teach or suggest their combination. Thus, the Examiner has

essentially employed hindsight to simply compile a listing of elements in attempting to recreate the Appellants' improved permselective module configuration, rather than determining whether the prior art would have suggested the present invention to one of ordinary skill in the art.

The Examiner has identified the following specific elements in the four cited references, and summarily asserted that it would have been "obvious" to combine these features to arrive at the present invention:

Sekino: a module with two hollow fiber bundles, and a permeate discharge "at the end of one of the modules";

Bikson: a module with a single fiber bundle with a endplate feed inlet, alleged to teach "positioning the retentate outlet (2) at any position of the container wall";

Etienne: a module with a single fiber bundle with a central feed pipe, and positioning the retentate outlet near the end of the container through the container wall; and

Matsuura: a module with single fiber bundle, with a retentate outlet at the end of the module and through the container wall.

Importantly, the Examiner never discusses what in these references teaches or suggests their combination to obtain the present invention and its advantages. In fact, as discussed further below, in several instances these references teach *away* from such combination.

The Appellants submit that the Examiner has not met her burden of establishing that the references or the knowledge in the art suggests the present invention's approach to achieving its low-cost, low pressure loss, low suspended material build-up permselective module. The following address each of the references and their failures to teach or suggest the present invention.

Sekino: Sekino is cited as disclosing the "double bundle hollow fiber membranes" and claim 1's feed tube, connecting tube, container wall and ends, and permeate discharge. August 27, 2002 Final Office Action at 3. The Office Action acknowledges that Sekino does not disclose the feed provided through an end of the container, nor the non-permeate discharge proximal to the end of the container, but then asserts that the discharge of concentrate (non-permeate) is "at the end of one of the modules, where the major solids accumulation is expected." *Id.*

As noted in the Appellants' June 4, 2002 response, Sekino teaches an apparatus that is the polar opposite of the present invention in virtually every measure, with the only common elements being inclusion of two fiber bundles in the same housing. Otherwise, Sekino teaches:

- a high pressure loss design in which the feed fluid and the non-permeate must traverse a tortuous, high pressure loss path through the module;
- a feed inlet that is located in the center of the module, exiting the center dividing plate after a pressure loss-creating right-angle turn in the center plate;
- a non-permeate outlet that is located in the *face* of the center dividing plate, *i.e.*, directly facing the flow from the last portion of the module with little or no transverse flow to discourage build-up of pressure loss-creating sediments;
- a non-permeate outlet located at the *same* end of the second fiber bundle portion of the module as the feed inlet, a feature that results in a completely different flow distribution throughout and around the second bundle than the present invention (*i.e.*, rather than the present invention's even flow across the length of the bundle, the close proximity of Sekino's feed inlet to its retentate outlet results in higher flow in the bundle near the center dividing plate, and lower flow and less efficient separation and sediment purging at the other end of the Sekino's second bundle); and
- flow forced from the outside circumference of the first fiber bundle through the bundle and into the bundle's narrow center tube, an arrangement that creates a greater pressure loss than the present invention's feed flow from its center feed tube outward.

Nothing in Sekino itself, then, would suggest to one of ordinary skill in the art seeking to obtain the benefits of the present invention that Sekino be modified or combined with another reference to obtain the invention recited in claim 1.

Bikson: The Examiner maintains that because Bikson discloses a feed inlet through an end plate of a module and "positioning the retentate outlet (2) at any position of the container wall," it would have been obvious "to arrange the apparatus of [Sekino] to open the feed and retentate out as suggested by [Bikson]." August 27, 2002 Final Office Action at 3.

The Appellants respectfully maintain that (i) there is nothing suggesting the selective combination of these features of Bikson with Sekino to obtain the present invention's feed inlet and outlet arrangements, and (ii) Bikson does *not* suggest to one of ordinary skill to place the retentate outlet "at any location."

No Suggestion to Combine: Bikson is a single stage (single fiber bundle)

apparatus in which feed enters one end of the container and non-permeate exits through a *central* side outlet. Bikson Fig. 5. While the Examiner asserts that it would have been "obvious" to drop Bikson's central feed tube into Sekino, the Appellants believe this suggestion to be an example of the random identification of highly-specific features from disparate references, despite the absence of *any* suggestions for combination. The assertion that it would have been "obvious" to combine Bikson's feed tube with Sekino appears to have been made without any consideration of the consequences of the alleged "obvious" substitution, nor is there any identification of *anything* in Sekino, Bikson or any other source that would suggest that such a substitution would have obtained any of the present invention's advantages.

Review of these references confirms this as there is nothing in either reference suggesting that substitution of the Bikson central feed tube into Sekino would result in either lower pressure loss across the module, or reduction of pressure-loss increasing sediment build-up near Sekino's non-permeate outlet. Indeed, the Appellants maintain that one of ordinary skill would have viewed Bikson as suggesting *exactly the opposite* -- that such a substitution would require substantial redesign of Sekino to obtain a functioning permselective module, because substitution of Bikson's end plate-entry, central feed pipe would have resulted in the first fiber bundle being completely bypassed without further changes. One of ordinary skill further would have recognized that use of such an alternative design to maintain flow though Sekino's first module would not have provided the sought-after advantages of low pressure loss and avoidance of pressure loss-creating sediment build-up of the present invention. For example, an alternative flow pattern such as reversing flow through Sekino's inlet 8 to obtain a non-permeate outlet from the first module (a fundamental change in the operation of Sekino), would not have cured Sekino's pressure loss and sediment build-up problems -- the modified Sekino module would still have outlets in the face of Sekino's central divider plate which do not discourage build-up of pressure loss-inducing sediments (and in fact leave dead areas near the container walls for solids accumulation), and uneven flow distribution in the second bundle (as a result of the second bundle inlet and outlet being so close together).

The Examiner's assertion of obviousness to combine Bikson's feed tube with Sekino is thus unfounded, as the mere fact that Bikson has a central feed tube, with no further suggestion in the references or elsewhere that the proposed combination would result in any of the benefits of the present invention, is insufficient to support an obviousness rejection.

Asserted Feature Not Taught: In the August 27, 2002 Final Office Action, the Examiner repeats a prior assertion that Bikson teaches that the non-permeate outlet can be located *anywhere* along the length of the container side wall. August 27, 2002 Final Office Action at 3; *see also, e.g.*, September 11, 2001 Office Action at 4 (citing Bikson at 8:28-62 as supporting the assertion that port 2 need "not necessarily [be] positioned" at the center of the side wall).

As the Appellants noted in their prior responses, Bikson does nothing more than confirm that its central side port *need not be located precisely centered* in the side of the container. Bikson at 8:29-34. There is *nothing* in Bikson that suggests that it would be satisfactory to locate its outlet at the end of the container, let alone any suggestion that such relocation would result in the present invention's lower pressure loss and sediment purging improvements, either in Bikson or in any other reference. In fact, while Bikson does indicate that its central side port 2 may be moved *off-center*, it also notes in the same breath that this displacement is *limited*, and further expressly notes that "preferably, however, first port 2 is *essentially at the center* [of the side wall]." Bikson at 8:29-34. Were this not enough to confirm that Bikson does not teach or such broad freedom to relocate its outlet, the cited passage further states that that if tube 2 were to be located too close to the end of the housing, either the annular space pressure would be undesirably high, or the annular space would have to be so large as to significantly decrease the volume available for hollow fibers, *thereby significantly decreasing the efficiency of the apparatus. Id.* The cited portion of Bikson thus clearly teaches *away* from the present invention's location of the non-permeate outlet "substantially proximal" to one end of the housing.

Because there is nothing in Bikson that would provide a suggestion to one of ordinary skill to move Bikson's outlet port 2 to "any position of the container wall" as maintained by the Examiner, this reference does not teach or suggest this feature.

In view of the forgoing, the Appellants maintain that the Examiner has not met her burden of establishing that there was any teaching or suggestion in Sekino, Bikson or elsewhere for the modification of Sekino with the selected features of Bikson.

Etienne: The Examiner cites the next reference, Etienne, as teaching an end feed inlet and end residue or retentate outlet, and asserts that this reference suggests "the positioning of the residue outlet at the end of the container." August 27, 2002 Final Office Action at 3.

The Appellants maintain that the mere fact that a reference discloses an end plate exit for non-permeate fluid does not teach or suggest the present invention's "non-permeated fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall in communication with a gap and the outside of the container wall ... wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module."

Once again, the Examiner appears to have merely visually identified a "part" in a reference's figures that allegedly corresponds to a feature of the claimed invention, and asserted that it would be obvious to modify Sekino and Bikson to incorporate the additional feature -- all without any explanation as to where any suggestion to so combine these references can be found, either within the references themselves, or elsewhere. Moreover, there is nothing in Etienne that one of ordinary skill would interpret as teaching or suggesting Etienne's center end plate non-permeate outlet be combined with Sekino and/or Bikson to obtain the present invention or its benefits.

As noted in the Appellants' prior responses, this reference teaches a non-permeate outlet *dead center in the end cap* of the housing -- a location that one of ordinary skill would immediately recognize as inherently permitting the accumulation of pressure-loss increasing solids deposits in the low-flow areas around the entire periphery of the housing end cap. Accordingly, one of ordinary skill seeking to solve the pressure drop and sediment accumulation problems addressed by the present invention would recognize this configuration to be a poor choice for maintaining flow in a manner that minimizes solid materials build up. Importantly, there is nothing, either explicit or implicit, in Etienne that suggests otherwise, and the Examiner offers nothing to counter this distinct teaching away from the present invention's outlet "opposed to the outer surface of each element and extending through the container wall ... substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials." [1]

[1] Etienne is also cited as teaching a *permeate* outlet through the container *side* wall (August 27, 2002 Final Office Action at 3). However, because there are no suspended materials in the permeate (having passed through the purifying hollow fiber walls), Etienne teaches nothing regarding placement of the *non-permeate* outlet in a manner that avoids suspended material build up and resulting pressure losses. This feature is also irrelevant to the attempted combination of Etienne with Sekino, as use of a side permeate outlet would require a complete

Etienne thus does not provide any suggestion of its use with Sekino and Bikson to one of ordinary skill attempting to address the problems solved by the present invention.

Matsuura: Finally, the Examiner cites Matsuura as teaching a housing with a retentate outlet at one end of the housing and through the housing wall, and argues that it would have been obvious to "modify a hollow fiber membrane module" [presumably, Sekino's] to provide a retentate outlet "at the end of the module and in contact with the retentate space" between the bundle and the container. August 27, 2002 Final Office Action at 3-4.

As a threshold matter, the Appellants submit that the figure cited in Matsuura, Fig. 7.10, does not teach or suggest anything more than a "drain outlet" through the side of the container. In fact, rather than offering any suggestion to add this "drain outlet" to the Sekino module, Matsuura does not even contain sufficient information for one of ordinary skill to ascertain whether the "drain outlet" is a non-permeate outlet, or even that the outlet is open during module operations (rather than being periodically opened only for module service, as would be expected for a "drain").

Review of Fig. 7.10 shows only that there is a permeate outlet 4 on top of the module. There are no other details provided of the flow within the module, and in particular, the flow within the left end of the module. Thus, there is insufficient information for one of ordinary skill to tell whether "drain outlet" 9 is a non-permeate discharge or, for example, just a "drain" for module cleaning purposes. Indeed, the end view in Fig. 7.10 shows the module equipped with two ports; when these ports are combined with the description of item 6 as a "feed/concentrate header" and the absence of any apparent divider between permeate outlet 4 and drain outlet 9, one of ordinary skill would recognize that it is entirely possible, if not probable, that feed enters the module on the right through one-half of the fiber and reverses direction at header 6, emerging as "concentrate" (non-permeate) at the right end of the module from the other half of the fibers, *i.e.*, *not through drain outlet 9*. Thus, the Examiner's assertion that Matsuura teaches *anything* about non-retentate discharges through the side of a module is ill-founded.

Even assuming Matsuura taught *anything* about drain outlet 9 that suggested it is a non-permeate drain, this reference teaches nothing with respect to the claimed invention.

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redesign of the flow in Sekino, which features end-plate permeate outlets for permeate that has passed into the center of the hollow fibers in each fiber bundle -- in other words, an alteration of Sekino's fundamental principles of operation.

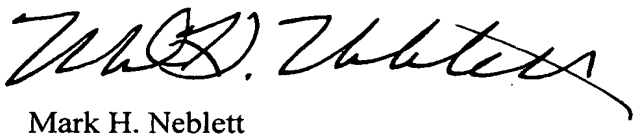
Matsuura contains no teaching or suggestion that its drain outlet should be located such that "any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module," as required by the pending claims. In fact, the housing disclosed in Matsuura shows "drain outlet" 9 located sufficiently far away from the end of the container that, unlike the present invention, solid materials could easily accumulate at the end portion of the container and thereby increase pressure loss within the device.

In the absence of any language in Matsuura addressing how close the drain outlet should be placed to the end of the module, or anything in Fig. 7.10 illustrating placement of the outlet close to the end of the module in order to obtain improved suspended materials purging, the Examiner cannot sustain the allegation that there is any suggestion to combine Matsuura with any of the remaining references to obtain the present invention.

CONCLUSION

The foregoing demonstrates that the Examiner in this case has failed to establish a *prima facie* case of obviousness under § 103(a). The Appellants respectfully submit that all claims on appeal distinguish over the unconnected compilation of art cited by the Examiner, and therefore respectfully request that the pending rejections of these claims be reversed and the Examiner be directed to pass claims 1-2 and 5-6 to issue.

Respectfully submitted,



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APPENDIX

to Brief of Appellants KATSUBE *et al.*,
U.S. Patent Application Serial No. 09/066,168
(Second Appeal)

CLAIMS ON APPEAL

1. A permselective membrane module comprising i) two permselective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements communicate with each other via a connecting tube to form a conduit having one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space, ii) a feed port provided at one end of the container in communication with the opened end of the conduit, iii) a permeate-liquid outlet facing the open end of the hollow fiber bundle of each element and extending through the container wall, and iv) a non-permeated fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall in communication with a gap and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

2. A permselective membrane module comprising i) two permselective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the

feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements have one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space, ii) a feed port provided at one end of the container in communication with the opened end of the feed tube of one of the elements, iii) an inner liquid receiving plate located between the two elements to collect the liquid not permeated through said one elements, iv) a connecting tube for connecting the inner liquid receiving plate with the open end of the feed tube of the other element, v) a permeate-liquid outlet facing the open end of the hollow fibers of each element and extending through the container wall, and vi) a non-permeated fluid discharge outlet located as opposed to the outer surface of the other element and extending through the container wall in communication with the space and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

5. A permselective membrane module comprising i) two permselective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements communicate with each other via a connecting tube to form a conduit having one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space and two end walls, ii) feed port provided at one end of the container in communication with the opened end of the conduit, iii) a permeate-liquid outlet facing the open end of the hollow fiber bundle of each element and extending through the end wall of the container adjacent to the open end of the hollow fiber bundle of each element, and iv) a non-permeated

fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall in communication with a gap and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

6. A permselective membrane module comprising i) two permselective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements have one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space and two end walls, ii) a feed port provided at one end of the container in communication with the opened end of the feed tube of one of the elements, iii) an inner liquid receiving plate located between the two elements to collect the liquid not permeated through said one elements, iv) a connecting tube for connecting the inner liquid receiving plate with the open end of the feed tube of the other element, v) a permeate-liquid outlet facing the open end of the hollow fibers of each element and extending through the end wall of the container adjacent to the open end of the hollow fiber bundle of each element, and vi) a non-permeated fluid discharge outlet located as opposed to the outer surface of the other element and extending through the container wall in communication with the space and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.